

**REMARKS**

Claims 1-20 are active in this application. Claims 5-8 and 13-16 stand withdrawn from consideration.

Applicants wish to thank Examiner Steele and the supervisory Examiner for the helpful discussion on May 21, 2007. The differences between the present invention and the cited prior art was discussed with reference to the conceptual drawings below.

Further, the Examiners requested to file the conceptual diagrams of the fibers in the form of a Rule 132 Declaration. The same is attached herewith.

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The rejection of Claims 1, 2, 9, 10, 17 and 18 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Deguchi et al, the rejection of Claims 3, 11 and 19 under 35 U.S.C. § 103(a) over Deguchi et al in view of Maeda and the rejection of Claims 4, 12 and 20 under 35 U.S.C. § 103(a) over Deguchi et al in view of Howard are respectfully traversed.

The present invention as set forth in **Claim 1** relates to polyvinyl alcohol fibers having a flattened cross-sectional profile and having a mean thickness D ( $\mu\text{m}$ ) that satisfies the following formula (1):

$$0.4 \leq D \leq 5 \quad (1),$$

wherein

$$D = S/L;$$

S indicates the cross-section area ( $\mu\text{m}^2$ ) of the fibers; and

L indicates the length ( $\mu\text{m}$ ) of the major side of the cross section of the fibers.

The Examiner has recognized that Deguchi et al are silent with respect to the property D as claimed in Claim 1. In addition, the Examiner has recognized that Deguchi et al do not

In reply to Office Action dated January 22, 2007

provide the necessary fiber dimensions to perform the calculation of D. See Office Action of January 1, 2007, page 2, last paragraph.

Polyvinyl alcohol fibers are generally disclosed in a long list of polymers at col. 4, lines 38 and 39 of Deguchi et al. However, there is no disclosure or suggestion of a fiber as claimed in Claim 1 of the present invention having a flattened cross-sectional profile and having a mean thickness D ( $\mu\text{m}$ ) that satisfies the following formula (1):  $0.4 \leq D \leq 5$ . Thus, the claims of the present invention cannot be anticipated.

As stated in the specification at page 5, lines 8-13:

In formula (1), if the mean thickness D of the fibers is over  $5 \mu\text{m}$ , then the fibers could not be split with ease and would require large shear force to be applied thereto for splitting them, and therefore the processability of the fibers will be poor. When the value D is smaller, then the fibers could be more readily split; but if D is smaller than  $0.4 \mu\text{m}$ , then the fibers would be split while they are produced or while they are carded, and the productivity of the fibers will be therefore poor.

Applicants submit herewith a Rule 132 Declaration showing the differences of the present invention and Deguchi et al.

Deguchi et al obtain a flat fiber having a flattened portion partially or wholly along the longitudinal direction of the fiber can be prepared by subjecting a fiber to a sand mill (col. 5, lines 53-57 of Deguchi et al). A specific degree of flatness of the fiber is obtained in the place where the fiber is crushed physically.

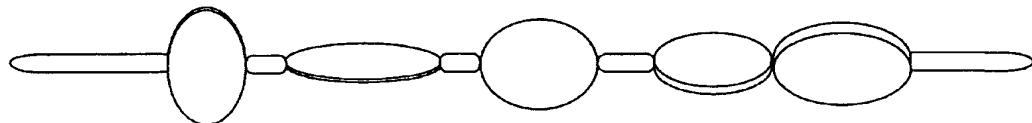
The flat fiber obtained by Deguchi et al's method may have varying degrees of flatness depending on the condition of physical power, and therefore an uneven structure. Moreover, the direction from which the fiber receives physical force also varies, the flat portions are disordered. Using Deguchi et al's method, neither the variation in the degree of flatness nor the disorder of the flat side may be avoided.

As a result, the flat fiber manufactured using Deguchi et al's method, exhibits poor wiping performance since a perfect fibrillation fiber is not obtained.

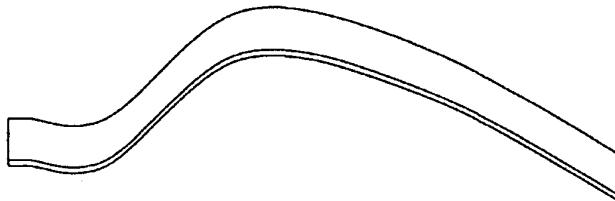
In contrast, in the present invention, the degree of flatness is controlled completely and, moreover, a flat side is continuously formed in the same plane. Therefore, wiping performance is excellent since fibrillation advances continuously in the fiber direction and a perfect fibrillation fiber can be obtained.

For illustration purposes, the conceptual diagram of the fiber form of Deguchi et al and the fiber form of the present invention are shown below.

[Conceptual diagram of the fiber form of Deguchi et al]



[Conceptual diagram of the fiber form of this invention]



As seen from the conceptual diagrams, the fibers of Deguchi et al and the present invention are substantially different.

Further, the examples in the specification show that excellent fibrillability, hydrophobicity, chemical resistance and wiping potency are obtained using the claimed fiber of the present invention. Table 1 below is copied from page 14 of the specification.

Table 1

	Cross-Sectional Profile	D (µm)	L/D	Fibrillability	Hydrophilicity	Chemical Resistance	Wiping Potency			
				Microscopic Observation	Water-Absorbing Speed (mm/5 min)	Result	Dissolution (%)	Result	Residue after Wiping (%)	Result
Example 1	flattened	3	15	good	124	good	<1	good	4.0	good
Example 2	flattened	3	21	good	128	good	<1	good	3.1	good
Example 3	flattened	3	25	good	123	good	<1	good	5.0	good
Comparative Example 1	flattened	3	4	not good	125	good	<1	good	14.8	not good
Comparative Example 2	cocoon-shaped	-	-	not good	111	good	<1	good	15.1	not good
Comparative Example 3	rounding	-	-	good	98	not good	19	not good	9.8	not good

As stated at page 15, 1<sup>st</sup> paragraph of the specification:

The PVA fibers of the present invention may be readily split into single fibers, when having received shear force applied thereto. They can be readily fibrillated without compromising the physical properties such as the chemical resistance, the hydrophilicity the weather resistance and the tenacity thereof. The fibrillated fibers may be formed into dry-process or wet-process nonwoven fabrics. In addition, the dry-process and wet-process nonwoven fabrics formed of the fibrillated fibers of the present invention are superior to those formed of conventional fibrillated fibers in point of the water absorbability and the wiping potency thereof. Further, when the fibrillated PVA fibers of the present invention are sheeted along with a cement slurry, then they may form wet-process slates. When the fibers of the present invention are kneaded with plastic or rubber, then they may form plastic or rubber products reinforced with the fibrillated PVA fibers.

The excellent properties of the claimed PVA fibers having the claimed dimensions is not disclosed or suggested in Deguchi et al.

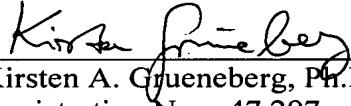
Maeda and Howard do not cure the defects of Deguchi et al. As recognized by the Examiner, Maeda does not disclose flat fibers (Office Action of January 22, 2007, page 4, first paragraph). Howard was only used to show the use of fillers.

Therefore, the rejection of Claims 1, 2, 9, 10, 17 and 18 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Deguchi et al., the rejection of Claims 3, 11 and 19 under 35 U.S.C. § 103(a) over Deguchi et al in view of Maeda and the rejection of Claims 4, 12 and 20 under 35 U.S.C. § 103(a) over Deguchi et al in view of Howard are believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of these rejections are respectfully requested.

This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

  
\_\_\_\_\_  
Kirsten A. Grueneberg, Ph.D.

Registration No.: 47,297

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
NFO:KAG:  
(OSMMN 01/07)